



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant:

Daniel Xu et al.

Serial No.: 09/976,641

Filed: October 12, 2001

For: Reducing Leakage Currents in
Memories With Phase-Change
Material

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Art Unit: 2815

Examiner: B. Baumeister

Atty Docket: ITO.0004US
P12497

TECHNOLOGY CENTER 2800

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Commissioner for Patents
Washington, DC 20231

REPLY TO PAPER NO. 11

Sir:

In response to the office action mailed November 7, 2002, please reconsider the above-referenced patent application in view of the following remarks:

REMARKS

In the office action (paragraph 2a), the Examiner indicates that *Ovshinsky* teaches everything but the presence of a lightly doped n-type region disposed around an n+ word line. *Ovshinsky* does not teach a buried line of the type described in the third paragraph of claim 11. Moreover, it does not teach a region of the second conductivity type set forth in the fourth paragraph of the claim.

The claim as currently positioned calls for a buried line that includes a more heavily doped region with a more lightly doped region over the more heavily doped region and a more lightly doped region under the more heavily doped region. These elements are not taught by either reference. All that *Ovshinsky* shows in the bulk substrate is what the Examiner calls a word line. It does not show anything other than a bulk substrate and a phase change material. Thus the pertinence of *Ovshinsky* is certainly extremely difficult to understand.

Date of Deposit: January 7, 2003

I hereby certify under 37 CFR 1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated above and is addressed to the Commissioner for Patents, Washington DC 20231.

Jo Ann Taylor

Claim 11 also calls for a region of second conductivity type opposite the conductivity type of the buried line is positioned under the phase change material and over the line.

Chang does not even relate to a phase change material and is not much more pertinent than *Ovshinsky*. While the Examiner contends that *Chang* shows a region of a second conductivity type (namely the region 40), the Examiner contends that *Chang* teaches a buried line. But of course he does not. To teach the buried line, he needs a more heavily doped region which could be the region 32 and two regions of more lightly doped material (one of which could be the region 38). But the other of the more lightly doped regions is also missing.

The Examiner simply concludes that it would have been obvious to one of ordinary skill in the art to include the additional more lightly doped region without any indication of why it would be obvious or where in any reference that feature is suggested. Certainly there is nothing whatsoever in the *Chang* reference to suggest that this missing element should be used. It is merely with the benefit of hindsight reasoning that the Examiner insists that *Chang* teaches the claimed feature. There is nothing in either *Ovshinsky* or *Chang* that suggests putting a more lightly doped region between the line and the claimed region.

There is nothing in *Ovshinsky* to anyway suggest that anything he was doing was designed to reduce leakage current. In fact he did nothing to reduce leakage current. Therefore to suggest that *Ovshinsky* could be reconfigured in some way to solve a problem he never recognized is certainly the epitome of hindsight reasoning. The argument in paragraph d that the Examiner can simply read sidewall spacer out of the claim is certainly a tremendous stretch. There simply is no sidewall spacer in the cited reference.


The same arguments discussed above apply to claim 21.

In view of these remarks the application is now in condition for allowance and Examiner's prompt action accordance herewith is respectfully requested.

Respectfully requested,

Date:

1/7/03



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